IN THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application.

1 - 4. (Cancelled)

5. (Currently amended) A computer-implemented method of parsing a mathematical optimization problem comprising:

reading a plurality of algebraic expressions that represent a mathematical optimization problem, each algebraic expression in said plurality having one or more mathematical terms;

creating a set of signomial expressions by converting each of said mathematical terms to a signomial, at least one of said signomial expressions having a negative coefficient; and

converting said set of signomial expressions to a compact numeric format to be accepted by a computer-aided geometric program solver.

6. (Original) The method of Claim 5, wherein said algebraic expressions include an objective and a set of one or more constraints.

7. (Original) The method in claim 6, wherein:

said objective includes an expression of one or more mathematical terms; and

each constraint in said set includes either an inequality or equality of one or more mathematical terms.

8. (Original) The method in claim 7, wherein:

each mathematical term includes one or more optimization variables.

9. (Original) The method of Claim 5, further comprising:

prior to said converting, determining that all signomial expressions in said set reduce to either a posynomial objective, a posynomial inequality or a monomial inequality;

after said determining, identifying that said mathematical optimization problem is a geometric program.

10. (Original) The method of Claim 5, further comprising:

prior to said converting, determining that at least one of said signomial expressions in said set cannot be reduced to either a posynomial objective, a posynomial inequality or a monomial inequality;

after said determining, reporting to a user which of said signomial expressions in said set cannot be reduced to either a posynomial objective, a posynomial inequality or a mònomial inequality.

11. (Original) The method of Claim 10, further comprising the step of:

simplifying each signomial expression in said set by mathematically canceling a combination of a plurality of said signomials.

12 – 22 (Cancelled)

23. (new) A computer implemented method, comprising:

converting a plurality of algebraic expressions that represent a geometric program into a format that is acceptable to geometric program solver software, said converting comprising for each algebraic expression of said plurality of algebraic expressions:

a) converting said algebraic expression into a signomial expression by converting terms of said signomial expression into a signomial function;

b) reducing said signomial expression to one of the following:

1) a posynomial objective;

2) a posynomial inequality;

3) a monomial equality.

24. (new) The method of claim 23 wherein said method further comprises making a substitution if said algebraic expression an internal variable that represents a previously assigned expression.

25. (new) The method of claim 23 further comprising simplifying the signomial expression by canceling two identical signomial functions of opposite sign.

26. (new) The method of claim 23 further comprising finding said algebraic expressions within lines of an input source file.

27. (new) The method of claim 23 wherein each one of said algebraic expressions is one of the following:

1) an objective function;

2) an equality constraint;

3) an inequality constraint.

28. (new) The method of claim 23 wherein said geometric program is a signomial program.

29. (new) A computer implemented method, comprising:

converting a plurality of algebraic expressions that represent a geometric program into a format that is acceptable to geometric program solver software, said converting comprising for each algebraic expression of said plurality of algebraic expressions:

combining mathematical terms of said algebraic expression to reduce said algebraic expression to one of the following:

1) a posynomial objective;

2) a posynomial inequality;

3) a monomial equality.

30. (new) The method of claim 29 wherein said mathematical terms are from the group consisting of:

signomial;

posynomial; and,

monomial.

31. (new) The method of claim 30 wherein said combining mathematical terms comprises identifying each mathematical term as a signomial, posynomial or monomial.

32. (new) The method of claim 31 wherein said combining mathematical terms comprises determining if operators and functions that relate said mathematical terms permit said reduction.

33. (new) The method of claim 31 wherein said posynomial inequality is a posynomial function less than one and said monomial inequality is a monomial function equal to one.

34. (new) The method of claim 29 wherein said posynomial inequality is a posynomial function less than one and said monomial inequality is a monomial function equal to one.

35. (new) The method of claim 29 further comprising finding said algebraic expressions within lines of an input source file.

36. (new) The method of claim 29 wherein each one of said algebraic expressions is one of the following:

1) an objective function;

2) an equality constraint;

3) an inequality constraint.

37. (new) The method of claim 29 wherein said geometric program is a signomial program.

38. (new) Program code embedded on a readable medium which when executed by a computer causes a method to be performed, said method comprising:

converting a plurality of algebraic expressions that represent a geometric program into a format that is acceptable to geometric program solver software, said converting comprising for each algebraic expression of said plurality of algebraic expressions:

a) converting said algebraic expression into a signomial expression by converting terms of said signomial expression into a signomial function;

b) reducing said signomial expression to one of the following:

1) a posynomial objective;

2) a posynomial inequality;

3) a monomial equality.

39. (new) The method of claim 38 wherein said method further comprises making a substitution if said algebraic expression an internal variable that represents a previously assigned expression.

40. (new) The method of claim 38 further comprising simplifying the signomial expression by canceling two identical signomial functions of opposite sign.

41. (new) The method of claim 38 further comprising finding said algebraic expressions within lines of an input source file.

42. (new) The method of claim 38 wherein each one of said algebraic expressions is one of the following:

1) an objective function;

2) an equality constraint;

3) an inequality constraint.

43. (new) The method of claim 38 wherein said geometric program is a signomial program.

44. (new) Program code embedded on a readable medium which when executed by a computer causes a method to be performed, said method comprising:

converting a plurality of algebraic expressions that represent a geometric program into a format that is acceptable to geometric program solver software, said converting comprising for each algebraic expression of said plurality of algebraic expressions:

combining mathematical terms of said algebraic expression to reduce said algebraic expression to one of the following:

1) a posynomial objective;

2) a posynomial inequality;

3) a monomial equality.

45. (new) The method of claim 44 wherein said mathematical terms are from the group consisting of:

signomial;

posynomial; and,

monomial.

46. (new) The method of claim 45 wherein said combining mathematical terms comprises identifying each mathematical term as a signomial, posynomial or monomial.

47. (new) The method of claim 46 wherein said combining mathematical terms comprises determining if operators and functions that relate said mathematical terms permit said reduction.

48. (new) The method of claim 46 wherein said posynomial inequality is a posynomial function less than one and said monomial inequality is a monomial function equal to one.

49. (new) The method of claim 44 wherein said posynomial inequality is a posynomial function less than one and said monomial inequality is a monomial function equal to one.

50. (new) The method of claim 44 further comprising finding said algebraic expressions within lines of an input source file.

51. (new) The method of claim 44 wherein each one of said algebraic expressions is one of the following:

1) an objective function;

2) an equality constraint;

3) an inequality constraint.

52. (new) The method of claim 44 wherein said geometric program is a signomial program.

COMMENTS

The enclosed is responsive to the Examiner's Final Office Action mailed on September 13, 2004 and is being filed pursuant to the filing of a Request for Continued Examiner (RCE) as provided for under 37 CFR 1.114. At the time the Examiner mailed the Office Action claims 1 through 22 were pending. By way of the present response the Applicant has: 1) canceled claims 1 - 4 and 12 - 22; and, 2) amended claim 5 and, 3) added new claims 23 - 52. As such claims 5 - 11 and 23 - 52 are now presently pending.

Independent Claim 5

Independent claim 5 stands rejected under 35 USC 103 in light of the combination of "A Parser/Solver for Semidefinite Programs with Matrix Structure" (hereinafter, "the Shao-Po reference") and U.S. Patent No. 6,311,145 (hereinafter, "the Herschenson reference"). With respect to claim 5, the Examiner responded that

> Applicants have submitted that Herschenson does not disclose a signomial wherein some coefficients are allowed to be negative. . . . The claim never recites any coefficient being negative. Applicants have raised arguments on a feature that is not claimed and is improper.
>
> See, Examiner's Office Action response mailed 9/13/04, pg. 11.

In response, the Applicant has amended claim 5 to recite " at least one of said signomial expressions having a negative coefficient". The Applicant respectfully submits that claim 5 is allowable at least because the claim recites a distinctive feature of signomial expressions over the Herschenson reference which, as

discussed in the Applicant's previous Office Action response, does not contemplate signomial expressions.

Independent Claims 23, 29, 38 and 44

With respect to new independent claims 23, 29, 38 and 44, the Applicant respectfully submits that each of these claims are directed to the reduction of an expression to a posynomial objective, a posynomial inequality, or, a monomial equality; and, that neither the Shao-Po nor Herschenson references disclose or suggest reduction of an expression to a posynomial objective, a posynomial inequality, or, a monomial equality.

Moreover, the reduction of the Applicant's independent claims 23, 29, 38 and 44 are directed to producing expressions in a format suitable for a geometric program solver. By contrast the Shao-Po reference, which is co-authored by Stephen Boyd, is directed to a parser/solver program (SDPSOL) for semidefinite programming. Here, note the Applicant's discussion of SPDSOL in the Background section at pages 3 and 4 of the Applicant's specification. Parsing, generally, is directed to the preparation of a set of expressions that represent a problem for a solver software program, and, the Applicant's claims are largely drawn to a parsing process. The Shao-Po reference is not directed to the parsing of a geometric program, and, the Herschenson reference does not appear to be directed to parsing at all (rather, the Herschenson reference is directed to a specific geometric program (i.e., a specific problem) that addresses inductors in a circuit design). As such it is

not possible for the combination of the Shao-Po and Herschenson references to disclose, teach or suggest all of the Applicant's claim limitations. A similar argument can be made for the allowance of independent claim 5 as well.

Conclusion and Closing Comments

With all of the Applicant's independent claims having been demonstrated as being allowable over the prior art of record, the Applicant respectfully submits that all of the Applicant's are allowable. The Applicant's silence to the dependent claims should not be construed as an admission by the Applicant that the Applicant is complicit with the Examiner's rejection of these claims. Because the Applicant has demonstrated the patentability of the independent claims, the Applicant need not substantively address the theories of rejection applied to the dependent claims.